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TASTES IN A HOUSEHOLD MODEL:
AN APPLICATION TO FERTILITY DECISIONS

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ABSTRACT

This paper, which presents an expanded model for explaining fertility differentials, incorporates a number of factors sociologists have found important into an economist's household model. Predictive ability and bias are examined. The expanded model, which includes taste factors such as religion, aspects of socioeconomic status during adolescent years, and supply factors such as age and years married, has much greater explanatory power. The expansion alters some but not all of the results of the economic model. Insight is gained but many of the basic findings of the economic model are the same.

Tastes in a Household Model: An Application to Fertility Decisions

Both economists and sociologists study fertility decisions but from different perspectives. Economists have incorporated this aspect of human behavior into a household decision-making process, emphasizing the demand factors of costs and income. Sociologists emphasize supply factors as well as demand factors which economists term "tastes." This paper incorporates a number of demand factors that sociologists have found important into an economist's household model for explaining family size. The result is a far richer model.

Economists are relative latecomers to the study of determinants of population size. Following Becker [1960], economists have used a household model where couples are assumed to have "constant" preferences among alternative goods, services, and what is commonly referred to as "child services"--the satisfaction derived from children. From this basis the effect on number of children desired or acquired, of prices--including opportunity costs--and the effect of income on fertility are analyzed (see Becker [1960], DeTray [1973], Willis and Sanderson [1971], and Leibenstein [1974, pp. 457-79]).

Sociologists, demographers, and others emphasize different factors in explaining family size. Group norms and variables that affect motivation, determine standards for oneself, and impose restrictions or limit choices are stressed. Religion, size of family of origin, and cultural and educational factors all influence family size through the complex of shared experiences, norms, and sanctions on those within the group who do not comply with the norms. Many individuals become members of new groups having different norms as they continue through the life cycle. These new associations and experiences generally affect preferences and thus influence choices. Many of these factors

can be incorporated into an economist's model by looking at the preferences and the forces shaping those preferences, i.e., the factors underlying the indifference map (see Easterlin [1969]).

The inclusion of preferences should result in a model greatly improved over one which includes only cost and income factors, by (1) increasing the explanatory power of the model and therefore an understanding of fertility decisions, and (2) providing important "omitted variables" which should reduce the likely bias and inconsistency in the relationships estimated between only the traditionally included economic variables and fertility, or (3) showing that the economic model is not biased because of omitted variables, and is thus valid, although the model which includes preferences is still a better predictor.

1. THE EXPANDED MODEL

Economists see these preferences or tastes in relative terms. The strength or intensity of a couple's desire for children must be evaluated in the context of their desire for other goods. If two families have the same income, face the same direct costs, and have the same ideal family size but different preferences toward other goods and services, their relative preferences toward family size will differ. These preferences are partially molded by past and current environmental characteristics, including standard of living in one's adolescent years, religion, own family size, type of communtiy in which one lives, and years and type of education--factors studied by other social science researchers. Many of these factors also influence the expenditures considered necessary for children. While the magnitude of these expenditures may affect family size, it is taste factors that are behind many of them.

Basically, the process of taste formation suggested here is that individuals form their tastes through their experiences and the standards to which they have been exposed. An understanding of these preferences is essential to explaining individual decisions. Therefore, the correct specification of a microdemand model should, in general, explicitly control for taste differences. If taste factors are excluded the result may be a misspecification of the model, and empirical estimates of the coefficients are likely to have the problems generally associated with an omitted variable--bias and inconsistency. To illustrate, let

X = x_1, x_2, x_3, the included "traditional" cost and income variables

x_4 = an important taste variable

C = number of children, the dependent variable.

Now, suppose the true relationship is

$$C = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + u \qquad (1)$$

where u is a disturbance term that satisfies the standard assumptions. But instead, x_4, the taste factor, is excluded and the following relationship is estimated:

$$C = b_0' + b_1'x_1 + b_2'x_2 + b_3'x_3 + r. \qquad (2)$$

If the taste factor is correlated with the cost or income variables included in the model--if x_4 is correlated with either x_1, x_2, or x_3--then the disturbance term, r, will be correlated with one or more of the included variables. In this case, the covariance (rX_i) will not be zero so the estimates of the coefficient of the correlated variable will generally be biased and inconsistent. The extent of the bias depends upon the correlation between the included variable and the coefficient of the excluded variable, i.e., $E(b_1') = b_1 + r_{14}b_4$, so the bias equals $E(b_1') - E(b) = r_{14}b_4$, which can be positive or negative.

There is a loss even if the taste factor is not correlated with the included variables (if $\rho(X_4X_i) = 0$). In this case the constant term, b_0', will equal its true value plus the mean of the excluded variable, X_4, times its coefficient: $b_0' = b_0 + b_4\bar{X}_4$. This will not predict as well as will explicitly including X_4 in the equation, i.e., as $b_0 + b_4X_4$.

There is a gain if the taste factor is uncorrelated, for it lends strength to the economist's model and empirical results and suggests that these results are unbiased and consistent.

2. DATA

This study uses a specialized body of data, the National Bureau of Economic Research--Thorndike-Hagen (NBER-TH) sample, to incorporate taste factors into the economist's model and thereby test empirically the benefit of including them. These data consist of information collected over a 25-year period from more than 5,000 respondents, plus background information on their parents. The sample is a relatively homogeneous group of white male respondents, age 44-54 in 1969, with minimum education equivalent to high school completion. These men were among the 500,000 who volunteered for pilot, navigator, and bombadeer tests during World War II and, as part of this program, took the Aviation Cadet Qualifying Test. In 1955 Thorndike and Hagen resampled 9,700 of them to analyze the usefulness of aptitude tests in predicting future occupational success. The NBER obtained this information and recontacted 5,089 of this group in 1969. Two follow-ups were later conducted [Taubman and Wales, 1974, Ch. 4].

The information collected includes: actual number of children in 1969 (children); religion (PROT, CATH, JEW, other religion, no religion); age (AGE, WIFE AGE); years married (YRS MARRIED); education of respondent (high school, SOME COL, B.A., SOME GRAD, M.A., M.A.+, PROF. DEGREE) and education of

wife (WIFE NO HI, wife high school), WIFE SOME COL, WIFE B.A., WIFE GRAD); 1969 marital status (married, DIV-WID); 1955 and 1969 actual incomes (INCOME, 1955, Y69/1000); earnings of other family members (INCOME, WIFE 1958, INCOME, WIFE 1968), and other income (OTHER INCOME, 1958, OTHER INCOME, 1968); 1969 region of residence (MOUNTAIN, NORTH C, SOUTH, N.E., MIDATLANTIC, PACIF.); occupation of respondent in 1969 (PROP, TECH, professional, manager, blue collar), occupation of wife (teacher, nurse, clerical, technical, bookkeeper, secretary, etc.), and occupation of respondent's father (father's occupation); education of both sets of parents (mother's ed., father's ed., mother-in-law's ed., father-in-law's ed.); type of home and room lived in by respondent during adolescence (home, apartment, other; OWN ROOM, SH-OWN, share room); number of siblings of respondent (BIG FY); and types of schools wife attended (WIFE PUB H.S., WIFE PAR H.S., wife pub el., wife par el.).[1]

The percentage distribution of households by number of children for the NBER-TH sample and a comparative group of white women aged 40-49 in the U.S. in 1967 are presented in Table 1. The mean number of children for the NBER-TH sample is 2.82, close to that of the U.S. mean figure. The correlation coefficient between these two distributions is .95 and a chi-squared test is .70, well below the 5 percent rejection level for seven degrees of freedom. The percentage distributions of this sample (see Table 2) and that of white males in the U.S. population by religion are quite similar, although the NBER-TH contains fewer Catholics, more Jews, and more who classify themselves as Other. The educational level of the respondents is considerably higher than that of the U.S. white male population.[2] The occupational distribution shows a heavy concentration in the occupations with high status scale rankings, such as managers, proprietors, and salaried professionals. Not surprisingly, the income distribution is also greater than the white income distribution of the U.S. population. Thus, these individuals are comparatively more successful in terms of socioeconomic measures than the U.S. white male population as a whole.

Table 1

Percentage Distribution of Households by Number of Children
NBER-TH Sample and U.S. Population

	NBER-TH Sample	U.S. Population, Number of Children Ever Born to White Women Ever Married, 1967	
		40 to 44 Years	45 to 49 Years
Total	100.0	100.0	100.0
0	3.4	8.4	11.3
1	10.9	12.9	16.6
2	30.6	26.5	26.9
3	27.0	22.4	20.9
4	14.9	13.3	10.5
5	6.6	11.5	9.2
6	6.3		
7+		4.9	4.6
Mean	2.82	2.84	2.58

Note: Variable is defined differently in these two distributions. For the NBER-TH sample it is children in 1969, but for the U.S. Population it is children ever born. One would expect the U.S. figure to be larger, since it is not decreased by infant and child mortality.

Source: U.S. Department of Commerce, Current Population Reports Population Characteristics, Series P-20, No. 211 (January 26, 1971), Table 7.

The respondents' wives are more comparable to the U.S. white female population. The respondents' fathers and fathers-in-law are also above average in socioeconomic status but less so than the respondents. Twenty percent of the sample have fathers who were employed in occupations similar to their own. Sixty percent were upwardly mobile, moving into occupations with higher mean incomes and/or achieving higher levels of education than their fathers (for more detail, see Wolfe [1973, Ch. 2]).

3. FINDINGS

Empirical results for the expanded model are given below, using the NBER-TH data in Table 2. Overall, this model explains more, i.e., is a better predictor. Also, a number of coefficients on variables included in both the limited model and fuller model change, indicating bias in some coefficients in the limited model. However, these are limited to education and related opportunity cost, not to income or age.

Discussion of Variables

Taste factors are examined first, followed by a discussion of traditionally included variables and the evidence of bias in comparing the two models.

Religion. Sociologists have found religion to be one of the most important taste variables affecting fertility [Freedman, Whelpton, and Campbell, 1959]. The findings for the NBER-TH sample are consistent with these studies: Catholics have the largest families, with a mean of 3.33; Jews the smallest, with a mean of 2.41; Protestant and Other Religions intermediate, with a mean of 2.60. In multiple regressions reported in the first column of Table 2, the coefficient is large, positive, and significant for Catholics,

negative and not quite significant for Protestants, and generally negative for Jews. The difference between the Protestant and Catholic coefficients is approximately +.8. It has been questioned, however, whether religion influences preferences for family size directly or indirectly through such intervening variables as earlier age at marriage. The evidence here is that the Catholic influence per se remains strong, controlling for both age of respondent and wife and years married. Thus, the norm of large families appears to exert an effect on number of children independent of the effect of age at marriage.

Another question related to the influence of the Catholic church on family size is whether Catholics tend to differ from the rest of the population in terms of other variables correlated with family size. If so, then it would be the influence of these variables, such as education, income and background, rather than religion that creates the preference for larger families, i.e., the model would be misspecified because the effect of these factors would be included in the coefficient on religion. For example, higher education is thought to postpone marriage and thus childbearing. If Catholics have less education, then this could explain the family size differential. Interestingly, the findings are robust--the positive and strong relationship of the Catholic church to family size remains after other variables are controlled. In particular, controlling education of wife and husband, husband's income, husband's occupation, and controlling variables of socioeconomic background, such as being raised in a big family, having one's own room, and being raised on a farm, do not alter the results (see Table 2).

An additional variable, wife attending public high school or parochial school, also indicates the strength of the Catholic or religious influence. Wives who attended public high school have fewer children than those who attended parochial or private school.

Table 2

Regression of Traditional Economic Model, Religion Only Model, and Expanded Model (Number of Children as Dependent Variable)

	Economic Type Model	Religion Only	Expanded Model	Mean	Variance
Some college	-.01(.17)		-.08(1.44)	.24	
B.A.	.05(.83)		-.13(2.15)	.28	
Some graduate work	-.05(.54)		.09(.97)	.05	
M.A.	.09(1.03)		-.11(1.36)	.09	
Professional degree	.19(2.08)		.10(1.16)	.07	
Wife-no high school	.13(.90)		.01(.07)	.20	
Wife-some college	-.04(.81)		.02(.48)	.23	
Wife- B.A.	-.02(.27)		.29(5.07)	.19	
Wife-graduate work	-.32(3.14)		.51(4.37)	.04	
Income 1955/1000	.08(1.39)		.14(2.55)	.62	.15
Income 1969/1000	.01(3.38)		.01(3.56)	17.82	14.25
Wife's age	.21(5.05)		.15(3.85)	46.29	14.13
Wife's age^2	-.003(6.14)		-.002(5.23)		
Protestant		-.00(.04)	-.13(1.73)	.64	
Catholic		.77(9.56)	.66(8.36)	.23	
Jewish		-.18(1.64)	-.01(.06)	.05	
Wife-public high school			-.32(6.50)	.71	
More than five siblings			.09(1.66)	.15	
Own room			-.08(1.85)	.27	
Father-in-law farm			.20(2.71)	.08	
I.Q.-2nd Fifth			.06(.95)	.20	
I.Q.-3rd Fifth			.14(2.32)	.20	
I.Q.-4th Fifth			.18(2.89)	.20	
I.Q.-5th Fifth			.25(1.73)	.20	
Years married			.02(4.93)	22.46	22.60
Divorced-Widowed			-.72(5.45)	.02	
Proxy-log of wife's 1958 market wage			-2.63(11.52)	3.28	.02
Proprietor			.34(6.20)	.19	
Technical			-.23(2.72)	.06	
Mountain			.41(4.59)	.05	
North Central			.26(6.31)	.32	
Constant	.08	3.67	9.57		
Adj. R^2	.03	.06	.14		

Note: N = 4899

The evidence is strengthened by the homogeneity of the sample. All of the respondents served in the Air Force in World War II and by requirement of this program did not marry before 1943. (None married at a very young age.) All are in the top half of the population by education. Within this homogeneous group the differential is large and the findings consistent. Clearly, Catholics have a stronger relative desire for children independent of other variables which influence tastes for children.

These data on religion, then, are consistent with those of previous studies; Catholics (CATH) have the largest families. These findings are robust in that the inclusion of current status and background variables do not change the coefficients or alter their statistical significance. Thus, religion can be considered to influence tastes, perhaps through its prevailing attitudes or standards and rewards for conformity.

Socioeconomic status. Socioeconomic status during the youth of the respondent and his wife may affect their tastes. Individuals generally base their desired standard of living upon the standards they were exposed to during adolescence (Easterlin, 1969). Individuals from a high socioeconomic background will have greater expectations than those from poorer backgrounds; they will have a relatively stronger preference for material goods and, conversely, a weaker preference for children. Socioeconomic status is measured here by proxies: education of both spouses' parents, husband's father's occupation, type of house and sharing a room (OWN ROOM), wife's parents living on a farm (F.L. FARM), and size of family of origin (BIG FY).

The results are mixed and offer little support to the above hypothesis. Education of both spouses' parents, husband's father's occupation, and type of

house are rarely significant, and have inconsistent signs. An individual's attending school at an early versus a late age has no effect on his future family size, nor does his mother's work history as measured by her having worked once the respondent attended school. Sharing a room and size of family of origin, however, do lend some support to the hypothesis. Those who shared a room had more children on average than those who did not. The means are 2.91 for those who shared a room, 2.69 for those having their own room, and 2.84 for those who did both. In Table 2, the negative effect of having one's own room (OWN ROOM) can be seen. Those who grew up in a large family had, on average, slightly more children (+.09). Parents currently living on a farm, a proxy for wife growing up on a farm, also has a positive relationship to fertility. More accurate measures of early socioeconomic status might permit a better testing of the above hypothesis. Such measures, however, require extensive longitudinal data collection, which is difficult and expensive to obtain; therefore most studies rely on recall information instead.

Aptitude. An aptitude or I.Q. variable based on information collected in the Aviation Cadet Qualifying Test taken by the respondents in 1943 is used in dummy variable form. This battery of tests included reading comprehension, mathematics, arithmetic reasoning, numerical operation, dial and table reading, speed of identification, spatial orientation, mechanical principles, two-hand coordination, complex coordination and several other ability-type variables. (For more detail, see Thorndike and Hagen [1959, pp. 55-76] and Taubman and Wales [1974, Ch. 4 and App. V-A]). Factor analysis was applied to these tests [Taubman and Wales, 1974, pp. 206-209]. The factor used as I.Q. here and in another study using these data primarily encompasses verbal ability, mechanical principles, mathematical skills and reasoning [Taubman and Wales, 1974, pp. 207].

The I.Q. variable which presumably measures basic cognitive ability, is entered in dummy fifths with the lowest one dropped. As seen in the third column of Table 2, the coefficients are, from the second through the fifth fifth, .06, .14, .18, .25; they are significant at the 5 percent level, one-tail test, for the third through fifth fifths. They show more variation if only wife's education is included, since I.Q. is generally highly correlated with own education. The coefficients are close to those above when wife's education in dummies and 1955 and 1969 income are included, thus suggesting a similar correlation between income and I.Q. It does show that the respondents with higher abilities are having more children than those in the lowest ability group, although the trend is nonlinear. This relates to the "Cattell paradox" [Higgins et al., 1962], which concerns the phenomenon of observed large families among low I.Q. groups without a general decline in I.Q. level in the population.

Age and marital status. Additional variables measuring wife's age (WIFE AGE) and (WIFE AGE)^2), years married (YRS MARRIED) and marital status (DIV-WID) are included to reflect particular supply constraints and taste considerations. The age of the individuals reflects both certain life cycle phenomena and the general atmosphere regarding childbearing, including the effect of the war years, during couple's childbearing years. Years married reflects the length of time exposed to conception during marriage and, again, the effect of the war. Marital status also reflects the exposure to conception within marriage and, perhaps, additional attitudes toward the family. All four of these variables have the expected effects. Years married has a positive relationship and divorced or widowed has a negative relationship. The quadratic form for wife's age shows a positive and then a negative effect reaching a maximum

for women approximately 37 in 1971. Older women may have foregone some childbearing during the war while several of the younger women may not yet have completed it.

Education: A traditionally included variable. Education is a variable generally introduced into economic models of fertility. It has been used as a proxy for opportunity cost, to represent efficiency in home production and contraceptive knowledge. As an opportunity cost, it is expected to increase the relative cost of children compared to other commodities and therefore have a negative effect on fertility. As a production factor, more highly educated women are expected to be more efficient at producing child quality which may decrease the number of children through a substitution of quality for quantity (see, for example, DeTray [1973]). In terms of contraceptive effect, it should make desired number of children more nearly equal to actual number of children, again reducing fertility. Education should also be considered a taste factor which may have both positive and negative effects on fertility.

Wife's education shows a negative relationship to fertility in the limited 'economic type' model, similar to findings of other studies (see Table 3, Gardner and Willis models). There is little fertility difference between those with a high school education (the omitted group) and those who attended or completed college. Women with graduate training (Wife-Grad.) have the smallest families, and the coefficient on this dummy variable is negative and statistically significant (-.32) (Table 2, first column).

Once taste factors and a predictor of women's wages are introduced (Table 2, third column), the results for women who completed college (Wife-B.A.) and graduate work (Wife-Graduate Work) change rather dramatically, indicating that the previously omitted variables were correlated with these education variables. This results in a misspecification of the model for these education variables.

Husband's education shows a small positive relationship to fertility. The results of several other studies are presented in Table 3 and compared with mine where possible. Gardner [1973] and Willis [1973] show the more traditional negative association, while Ben Porath [1973] shows a positive association similar to the findings here.

A few other studies have noted a reversal from the negative relationship between education and fertility at the highest levels of education. In a study of a group of white urban Americans of above-average educational attainment, Bajema [1966] found that male college graduates have larger families than males with less education. He discerned an overall bimodal relationship between education and fertility. DeTray [1973] found a weak positive coefficient for male education in a regression where the dependent variable was children-ever-born and the male education variable was median years of schooling for males age 25+ by counties in the U.S. DeTray's equations include female education, median earnings of male and female, race, rural-urban classification, and median value of housing.

The present finding of a positive relationship between male's education and fertility does not appear so unusual when one recalls that the minimum level of education in this sample is high school completion. Thus, the entire lower education half of the U.S. population is omitted. Fitting my results with results for the bottom half might give a V-shaped or J-shaped relationship, a result not too different from others'.

Occupations. Most occupations are found to have little effect. The exceptions to this are that those in technical occupations have small families (the coefficient equals -.23) while business proprietors have large families (the coefficient equals .34).

Table 3

Comparison of Economic Model Studies
(Completed Family Size as Dependent Variable)

Variable	Gardner	Willis	Ben Porath	Wolfe/Gardner Model	Wolfe/Willis Model	Wolfe/Ben Porath Model
1. Wife Education	-.14 (3.1)	-.14 (14.31)	.05 (1.5)	-.02 (1.86)	-.01 (-.70)	-.02 (1.72)
2. Husband Education	-.06 (1.4)	-.07 (4.09)	.01 (0.4)	.02 (2.01)	.02 (1.83)	.04 (3.58)
3. Wife's age	.05 (3.6)			-.04 (7.99)	.21 (4.95)	
4. Income (Thousand) (67)	.03 (0.8)	-.07 (4.09)		.01 (4.40)	.01 (1.08)	
5. (RACE)	1.16 (4.8)					
6. 1 x 4		.01 (4.71)			-.00 (.46)	
7. Cohort		.06 (7.09)				
8. Cohort^2		.00 (4.13)			(wage^2) -.00 (6.02)	
9. SMSA		-.08 (7.15)			-.00 (.03)	
R^2	.19	.04	.02	.02	.03	.00
N	511 rural N.C. families	9169 1/1000 1960 Census	167 Kibbutzim Communities	4910	4910	4910

Note: The Gardner, Willis, and Ben Porath studies appear in the Journal of Political Economy 81, Part 2, pp. S106, S50, and S212 respectively.

Income. Income for both 1955 and 1969 shows a small positive relation to family size. Income in 1969 is equally significant in the equations with and without "taste" variables. The 1955 income is more significant in the expanded model, as expected. Income at earlier ages represents different points in the income profile and so does not represent permanent income as accurately as does the 1969 figure. But since these profiles, or the choice of paths, are affected by tastes, "controlling for tastes" affects the significance. Because these findings are positive in both models, it does not appear that the lack of positive or positive and significant results in other studies is due to bias from omitted variables (see Table 3 for examples). Rather, it may be that the positive income effect is found only in the upper half of the education distribution.

Tastes Regarding Quality of Children.

Quantity and quality can be regarded as alternate means of acquiring child satisfaction for the parents. A taste preference with regard to the quality of children is measured by the average level of education respondent's children are expected to complete (AV EXPECTED EDUC.) (see Table 4). There is a negative relationship between this expected level of education and family size, as is expected. This is significant but the coefficient is very small--approximately .03 per year of additional education--and the results are limited to those with children who responded to the expected education equation, approximately two-thirds of the sample. Presumably it would be preferable to have additional measures of child quality since education is only one of several possible dimensions which may vary in importance.

A Relationship Between Costs and Fertility.

The relationship between costs and tastes is conceptually clear but frequently difficult to formulate. For example, the costs that parents believe children entail may differ; but this reflects tastes. Thus, while the direct market prices are the same for an identical article of clothing, certain parents may view it necessary to buy better quality or more clothing than others. As Duesenberry put it: "Economics is all about how people make choices. Sociology is all about why they do not have choices to make" [Becker, 1970, p. 233]. The application to this study is that background factors affect tastes, i.e., in a sense, they limit choices. They affect the shapes of the indifference curve. Once those tastes, as well as income, are controlled, it is possible to examine the effect of changes in price.

Thus in the calculation of the cost of an additional child, parents who view larger expenditures on goods, services, education, etc. as necessary will have a higher cost figure than will those with lower expenditure expectations; however, differential tastes, not the marketplace, make the cost differ. In the view of sociologists, the choice of spending more on children is related to tastes, to the norms for such expenditures, which frequently reflect the couple's own experiences.

An example of this phenomenon is average expected years of education of a couple's children (AVER EXPECTED EDUC.). When this is used as the dependent variable, there is generally a positive association between the dependent variable and each increasing level of education in dummy variable form, as can be seen in Table 4. Holding all else constant, there is nearly a one-year difference in expected average level of education of children between women who did not complete high school and women with a B.A. This may relate both to biological

Table 4

Regression Including Average Expected Education of Children Explaining Family Size and Regression "Explaining" Average Expected Education

	Dependent Variable	
	Number of Children	Average Expected Education
Some college	-.13 (1.99)	.28 (3.26)
B.A.	-.15 (2.26)	.49 (5.70)
Some graduate work	.06 (.61)	.37 (2.72)
M.A.	-.04 (.47)	.57 (4.85)
Professional degree	.02 (.24)	.75 (5.80)
Wife-no high school	-.27 (1.65)	-.39 (1.78)
Wife-some college	.02 (.31)	.43 (5.80)
Wife-B.A.	.29 (4.53)	.58 (7.19)
Wife-graduate work	.48 (3.73)	.65 (4.46)
Income 1955/1000	.18 (2.86)	.25 (3.00)
Income 1969/1000	.01 (2.76)	.01 (3.80)
Wife's age$_2$	.13 (2.80)	-.12 (1.96)
Wife's age	-.002(3.83)	.002(2.24)
Protestant	-.23 (2.76)	.10 (.90)
Catholic	.50 (5.31)	.11 (.86)
Jewish	-.28 (2.24)	.69 (4.23)
Wife-public high school	-.51 (7.74)	.23 (2.37)
More than five siblings	.12 (2.02)	
Own room	-.14 (2.94)	
Father-in-law farm	.22 (2.75)	
I.Q.-2nd Fifth	.09 (1.27)	
I.Q.-3rd Fifth	.14 (1.95)	
I.Q.-4th Fifth	.11 (1.60)	
I.Q.-5th Fifth	.20 (2.85)	
Years married	.02 (3.09)	.10 (1.79)
Divorced-Widowed	-.55 (3.33)	
Proxy-log of wife's market wage	-2.12 (8.31)	
Proprietor	.33 (5.26)	
Technical	-.17 (1.79)	
Mountain	.39 (3.93)	
North Central	.22 (4.61)	
Average Expected Education	-.03 (3.83)	
Wife-parochial high school		.09 (.63)
Respondent's mother's ed.		-.01 (.34)
Wife's mother's ed.		-.02 (1.07)
Constant	9.27	16.33
Adj. R^2	.14	.09

Note: N = 3306

differences and environmental differences, including norms of the parents and the surrounding community. The positive correlation between own education and expected children's education is partially interpreted as evidence of the link between own socioeconomic status and expenditures considered necessary for one's children. It reflects tastes in this sense, and these tastes are thus related to a higher discounted price of children. It may, however, reflect the relatively lower cost of higher quality children to better educated parents--a price effect reflecting efficiency.

4. SUMMARY

The variables included in this study explain approximately .14 of the differential in family size as measured by the adjusted R^2. Tastes, costs, and income variables are all contributing factors.

The variables that are consistently significant include taste variables such as religion and having had one's own room while growing up; taste or cost variables such as respondent's education, educational plans for one's children, and wife's opportunity cost (Proxy, wife's income in 1958); supply variables such as current marital status and age; and a 1969 income variable.

When only those variables commonly included in economic analyses are included, i.e., education, income, and wife's age, the R^2 is only about .03. The addition of religion brings the R^2 to .09, while instead adding a proxy variable for wife working raises the R^2 to .05. Alternatively, adding taste variables plus marital status raises R^2 to .14. Thus, the inclusion of taste variables significantly improves the explanation of family size.

Besides improving the fit of the model, the inclusion of wife's opportunity cost and of taste variables changes the coefficients of education--some of the variables commonly included in economic analyses. This lends some support to the hypothesis that the omitted variables are correlated with the "economic

costs and income" variables, and that their omission causes bias and inconsistency in the estimates of the relationship between fertility and these variables. However, the robustness of income and age indicates lack of bias. Thus, an accurate microdemand model as illustrated by family size improves with inclusion of taste variables but does not sharply alter some of the results of the unexpanded economic model. Insight is gained, but many of the basic findings are the same.

NOTES

[1]Variables used in my model are written in upper case letters; variables not used here are in lower case.

[2]The education discrepancy is a limitation in applying any of the results to the total population, but given the rising trend in level of education among cohorts in the U.S. population, it can be considered to be moving toward the education distribution of the NBER-TH sample.

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